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SEAPLANES FOR COMMERCE.

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SEAPLANES FOR COMMERCE.

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It is a remarkable fact that practically all of the great development in the commercial use of airplanes which the last four years have seen in Europe should have been directed toward overland flying, or at most, toward the maintenance of services on routes involving over-water passages so short that they could safely be covered by airplanes equipped only for operation from and to the land. The use of the seaplane for purposes of peaceful transport has been almost unknown in the eastern hemisphere except for a short line in the Bay of Biscay and the rather intermittent operation of services between certain Scandinavian ports and between France and Corsica. The work of the Aeromarine Airways, with a record of three seasons' operation between Key West and Havana and with somewhat briefer experience between other Florida coast resorts and points in the West Indies, together with the maintenance of a daily service connecting Detroit and Cleveland during last summer, a record covering nearly a million passenger miles of flying, has kept America definitely in the lead in the use of aircraft over open water up to the present time.

It is hardly to be expected that that primacy will indefinitely be accorded without a struggle. The English, with traditional keenness of interest in all affairs maritime, have long been studying the possibilities both of the true marine airplane and of the amphibian, landing on and arising from land or water at will, and have finally arrived at the point of actual test in service. Dur-

* From Christian Science Monitor, February 26, 1923.

ing the coming spring a flying boat line will start operations between Cherbourg and Southampton, principally for the benefit of transatlantic voyagers, and its services are soon to be extended to the Channel Islands and to other ports along the English and French coasts. In other European countries, too, extensive seaplane services are under consideration.

Three Advantages.

The value of the commercial service that can be rendered by flying boats or amphibian aircraft, and the importance that should be attached to their development along commercial lines, obviously depends largely on local conditions, and the United States and the British Isles are peculiarly well fitted, by virtue of their geographical characteristics, for the fostering of such development. In general, however, whether conditions are exceptionally good or only mediocre, the seaplane starts with three distinct commercial advantages over the land type, and the lines to be exploited should be so chosen as to utilize those inherent advantages to the fullest.

The first, and perhaps the most obvious, of the points at which the seaplane scores is its superiority of speed over existing means of transport on the same routes. The airplane of any type always outpaces all its competitors by a good margin, but the difference of speed between the commercial airplane and the limited train is considerably less than that between the seaplane and even the fastest surface vessel. Not only is the actual improvement in speed greater on the over-water route than on that over the land,

but it must be borne in mind that a given change in speed gains in importance, as a time-saving factor, with reduction of the initial speed on which improvement is to be made. For example, an overland journey of 800 miles can be covered by fast train in 20 hours and by airplane, traveling at as high a speed as is commercially practical at the present time, in nine. The same distance would require 36 hours in a first-class ocean liner and 13 in a seaplane traveling at very moderate speed, about a third less than that assumed for the land airplane, so that, despite this more economical speed of operation, the saving of time would be more than twice as great over the water as over the land. The minimum airplane speed which will attract the traffic is of course much less for seaplanes than for machines which must meet energetic railroad competition, and the cost of operation per passenger mile can accordingly be less.

Second of the major advantages already alluded to is the continuity, so to speak, of available landing fields when flying over the water. With the possibility of making a descent anywhere it becomes possible to fly at a very low altitude, and most inexperienced passengers find it most pleasant to stay close to the surface on a long trip. The low-flying seaplane also requires very little preliminary organization along the route, as every harbor on the coast will serve as an airport in case of need and when flying under unfavorable conditions of weather, use can be made of the lighthouses and other warnings already set out for the use of mariners.

In order that the prospect of a sudden landing in the course of a flight, perhaps followed by a long journey over the surface of the water, under much reduced engine power or in tow of another craft, may be viewed with equanimity it is necessary that the seaplane qualify, not only in respect of airworthiness, but also as a staunch and stable boat, capable of navigating indefinitely in as rough a sea as is likely to be met with on the course flown. The last few years have seen great improvement in that respect. The original seaplanes were produced in most cases by airplane builders without much experience on boats, and they often gave the impression of having had the floats attached as an after-thought, and indeed without very much thought at any time. Now, however, it is fully recognized that the design of a flying boat hull is a task worthy of the best efforts of a naval architect, and that the construction is best entrusted to those with some knowledge of the lessons taught by centuries of slow and patient development of the art of building small craft light of structure, but capable of withstanding the buffeting of the waves. Research on hull design has been carried forward without stint in the naval laboratories of the world, and the result is shown in the change from the floats of 1912, little more than rectangular boxes with a slightly turned-up forward end, to the most recent hulls, the performance of which is predicted almost exactly as the result of model experiments and the seaworthiness of which is best demonstrated by such performances as that of the NC-3, during the transatlantic flight, slightly damaged in landing in a rough sea, but thereafter proceeding along

the surface of the water for 200 miles and coming into port under her own power.

Time Saving at Terminals.

Last of the special merits of the seaplane is to be enumerated the reduction of distance from the airport to the city that it serves. A very grave problem of air transport, both here and abroad, has been the frequent impossibility of finding a satisfactory location for a flying field within an hour's journey of the business district of a large city. With a seaplane no such problem arises, for when a city has a waterfront at all, and there are few real commercial centers without frontage on ocean, lake, or important river, the business district always grows up close to the docks. In every one of the first five cities in the United States, at least, a seaplane can be landed within a few minutes' ride of the center of financial activity. The saving in time at the terminals may easily make up for the usual difference in speed between the seaplane and the land airplane (although the disadvantage of the marine aircraft in this respect is by no means universal) and also for the following of a somewhat more circuitous route in order to remain continuously over water, as when following a winding river with a seaplane. It would be quicker, for instance, to cover 250 miles at 75 miles an hour with a 10-minute ride at each end than to go over a course 50 miles shorter at 100 miles an hour but with an hour sacrificed at each terminal.

If it were not for the added weight and sacrifice of useful

load in carrying both wheels and floats the amphibian would be the ideal type, as it could always follow the shortest overland course between termini and could land in the water alongside the docks, so combining the advantages of land and sea machines. Several experimental flights were made between London and Paris with amphibians a couple of years ago, the machines actually arising from the Thames and landing in the Seine. Further work along similar lines will no doubt take place.

Another possibility is the use of large flying boats overland without the provision of amphibian gears. Such operation would be impracticable and unsafe at the present time, but it will become possible as the further multiplication of power plant units, making the continued flight of the airplane independent of the failure of any single unit, and the improvement of the reliability of the individual units themselves make it possible to disregard the chance of a suddenly forced landing when over unfavorable country, not within reach of a satisfactorily large body of water.